Combining Neural Networks with Po Estimation Techniques Inventors: Man Mohan Rai and Nateri K. I NASA Case No.: ARC-14281-3 NASA POC: Vicide Kent (650) 604-0887

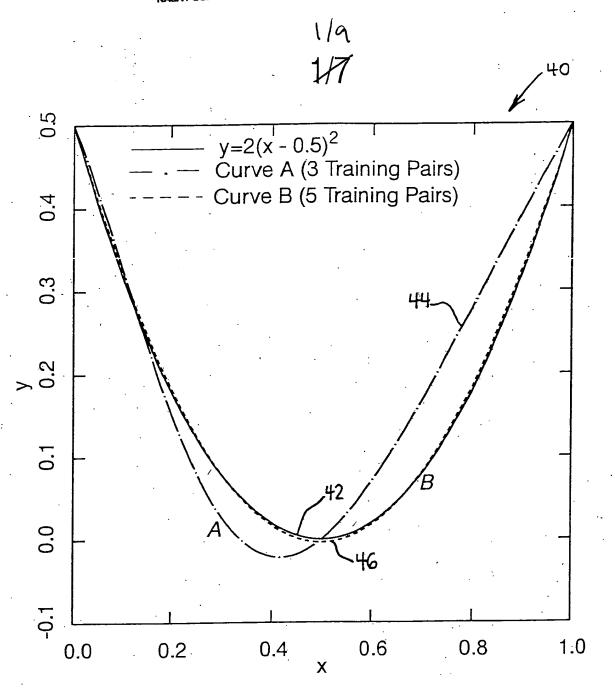


FIGURE 1

Combining Neural Networks with Polynomial Estimation Techniques Inventors: Man Mohan Ral and Nateri K. Madavan NASA Case No.: ARC-14281-3 NASA POC: Vickie Kent (650) 604-0887

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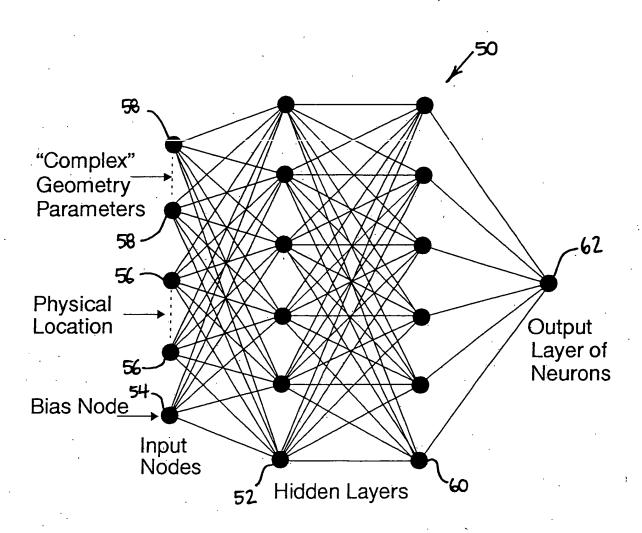


FIGURE 2

Sheet 3 of 9
Express Mail abel No.: EV088615645US
Title: Method for Constructing Composite Response Surfaces By
Combining Neural Networks with Polynomial Interpolation or
Estimation Techniques
Inventors: Man Mohan Ral and Nateri K. Madavan
NASA Case No.: ARC-14281-3
NASA POC: Vickie Kent (650) 604-0887

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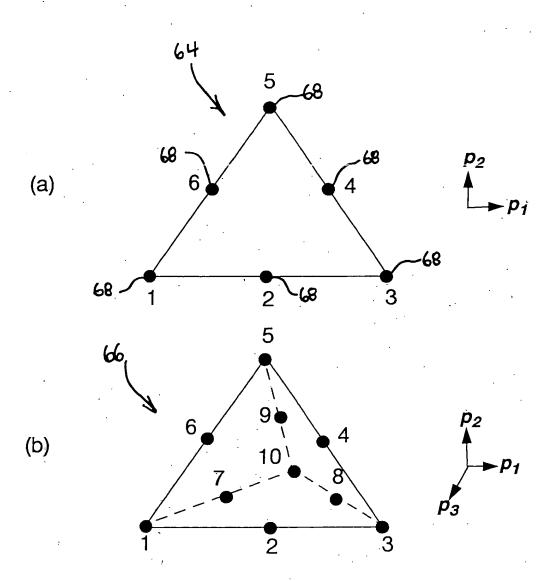


FIGURE 3

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Estimation Techniques
Inventors: Man Mohan Rai and Nateri K. Madavan
NASA Case No.: ARC-14281-3
NASA POC: Vickie Kent (650) 604-0887 90 Define Objective Function 100 Provide Starting Design Point 120 220 Calculate Generate Simplex Centered about a Polynomial Coefficients Point in Space 1.40 240 Generate Define Geometries Composite corresponding to Surface the Simplex Points 260 180 Search Region. Generate Grids of Design for each Space and Geometry Optimize 180 280 Choose fidelity Checkfor Level and Adequacy of Generate Solutions Design for each Geometry 300 200 340 Yes Are Conditions Train Neural Final design Met? Networks No 320 Provide New Design Point

FIGURE 4

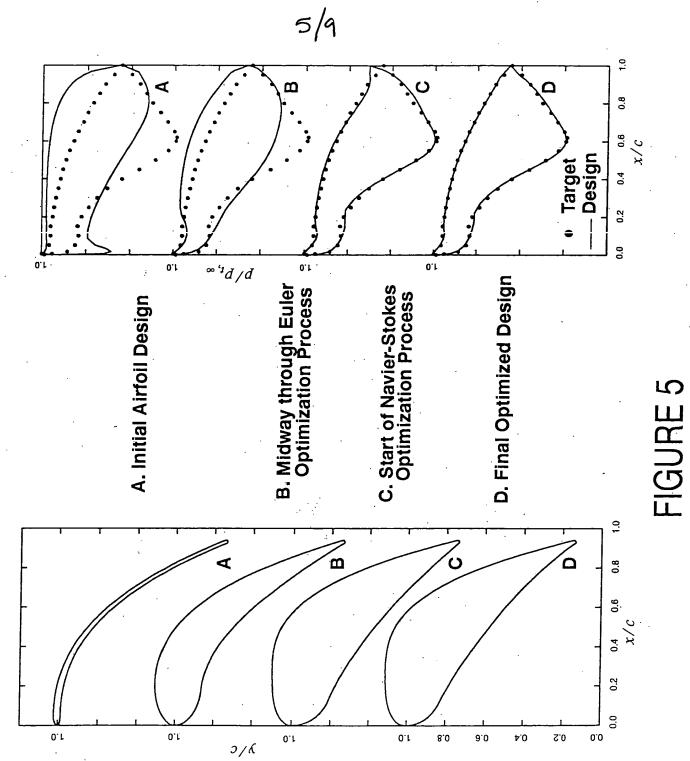


FIGURE 6

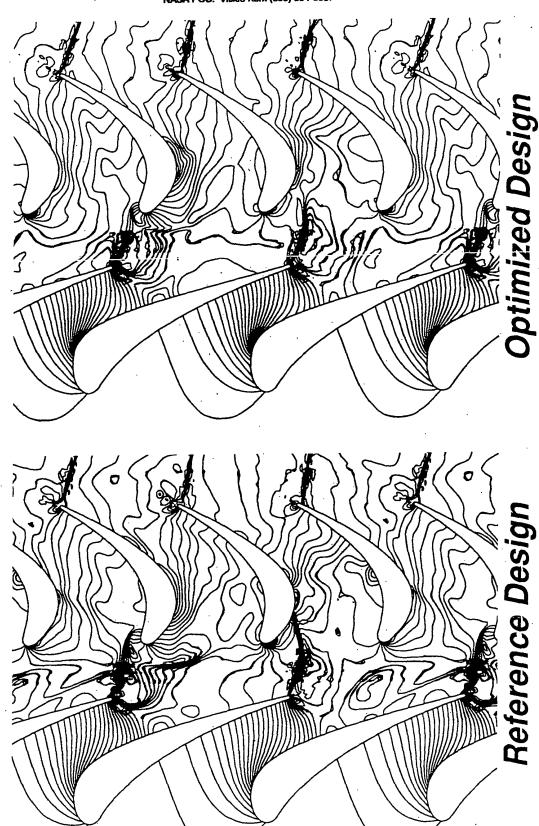
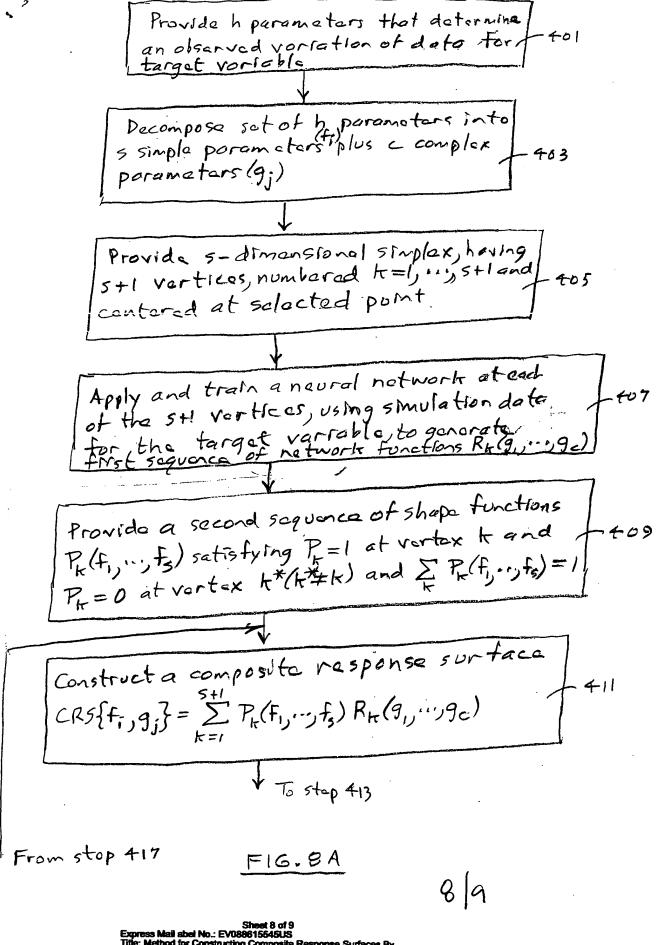


FIGURE 7



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NASA POC: Vickie Kent (650) 604-0887

Modify at least one shape function Pr(fi, --; fs)

Accept present composite response surface

F16.83

Sheet 9 of 9 Ss Mail abel No.: EV088615545US Inventors: Man Mohan Rai and Nateri K. NASA Case No.: ARC-14281-3 NASA POC: Vickie Kent (650) 604-0887